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ABSTRACT

To explain how writing is both cognitive and behavioral, this paper compares and contrasts behavioral and cognitive orientations within an instructional design. The first section addresses the weaknesses and strengths of a behavioral versus a cognitive orientation and relates them to Janet Emig's 1971 study, "The Composing Processes of Twelfth Graders." The second section, in a defense of behavioral orientation, contrasts a Skinnerian model with a Pavlovian model and looks at three disparities between the two models. The seven principles of Skinner-Box learning are then applied to writing. The next section applies the variables of the cognitive theory to writing. This is followed by an examination of the cognitive connection between the writer and the reader. The next section addresses the integration of learning theories into seven components of the instructional design: (1) conducting needs assessment and identifying/prioritizing instructional goals, (2) performing learning outcome analysis, (3) describing student entry behaviors, (4) grouping and sequencing learning objectives, (5) designing delivery systems, (6) designing or selecting learning activities, and (7) reinforcement. The section that follows considers a behavioral orientation to writing, a cognitive orientation to writing, and a combination of the two throughout the components of the instructional design. The paper concludes with a note on the affective domain. (HOD)

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A COMBINED BEHAVIORAL-COGNITIVE ORIENTATION TO AN INSTRUCTIONAL DESIGN ON WRITING

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INTRODUCTION

During the last several years, much of the theoretical understanding of the composing process has leaned towards a cognitive explanation. One can scan the table of contents of recent language arts journals and notice that for those articles which attempt to address a theoretical understanding of the composing process, cognitive theory is the predominant approach. While one would have a difficult time disputing cognitive claims to understanding the composing process, a major problem exists: writing is not just a cognitive act. Although the word PROCESS refers to cognitive activity, one must realize that these cognitive activities are greatly affected by external, non-cognitive factors.

Also, the majority of these articles deal only with portions of a writing task: prewriting as a search of cognitive structures, invention strategies as building

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cognitive structures by forming relationships among bits of information and forming meaning, and revision as a reflection of building cognitive structures even further. Seldom, if ever, do these articles include a cognitive orientation to a complete writing task (one paper) or to a writing unit (a longer course). It is only through analyzing a unit completely that one can fully and realistically understand all the variables involved in a writing task.

In a time when instructional programs are criticized for not challenging a student or not providing a student with a complete learning experience, a pure cognitive orientation to a composition unit does not help to answer these criticisms because such an orientation does not take into consideration such vital factors as writing stimuli, responses to these stimuli (essays or different stages of a writing task), and reinforcement of these responses (peer evaluation or formal evaluation). In fact, taking into account only the mental operations and the individual mental development of the writer can create writing units that may be as ineffective as those units which do not address cognitive aspects of the composing process. A complete instructional unit, whether on writing or any other discipline, which does not address behavioral and affective orientations is susceptible to many problems that could be

easily avoided.

The major focuses of this paper are to explain how writing is both cognitive and behavioral and to apply a writing task to a complete instructional design (an instructional design is a framework to which several components of any learning unit are applied in order to insure that all aspects of learning are considered). Behavioral and cognitive orientations within an instructional design will be compared and contrasted. The strengths and weaknesses of each will be addressed so that the compatibility (combination) between the two will become apparent. While the affective domain is as critical as the behavioral and cognitive domains, the affective domain will not be addressed but only commented on later.

Behavioral Orientation Versus Cognitive Orientation

One of the major complaints educational psychologists have about many existing instructional designs is that the designs, many times, either are not based on current theories or do not adhere to theoretical bases that are compatible. Still, another complaint is that basing an instructional design on only one theoretical orientation leaves the design either incomplete or locked into decisions that are not altogether as effective as they could be. A

remedy to this incompleteness or ineffectiveness is to combine two theoretical orientations, such as behavioral and cognitive so that the strengths of one will tend to negate the weaknesses of the other.

While cognitive theory deals with the mental operations that take place when learning occurs and with the mental development of the learner, it either ignores or minimizes the consequences (reinforcement or evaluation) involved in the process. On the other hand, even though behavioral theory deals with such consequences, it minimizes or ignores what takes place when learning occurs. Both reinforcement and mental operations/mental development appear to be major concerns in any effective instructional design.

One major assumption of cognitivists is that the students will be receptive to the learning task. They assume that if the students have the cognitive structures (one's organized unit of knowledge), they will be successful at doing that task. If the students are unsuccessful, it is because they lack the cognitive structures. Much has been written about motivation and attitudes toward learning tasks and the immense effect both have when a student approaches such a task. The cognitive assumption that the student is receptive to the task and is willing to do it minimizes the role of reinforcement in the learning process. The weakness of this assumption lies in the fact that if students are

not motivated to search their cognitive structures for information, then the desired learning will probably not take place.

People have criticized behaviorists for their coldness and automation: these orientations treat all students the same, regardless of individual mental operations used to process information. The critics feel that a behavioral orientation involves merely placing students in a situation, providing them with a stimulus, and expecting them to give a predetermined response. While this description does adequately explain one type of behavioral situation, there are others. Most critics regard behaviorism in the Pavlovian sense, but a much more effective alternative is the application of the Skinnerian model of stimulus-response-reinforcement. While the Skinnerian model adds the dimension of reinforcement to the Pavlovian model, it also allows for a different type of stimulus: one that is freely emitted. In the Pavlovian model, the stimulus is provided by the experimenter; this stimulus is such that a certain consistent response will be given. In the Skinnerian model, though, the stimulus is freely emitted by the student; the response will be predetermined in a general sense, but many closely related responses will be accepted. The major obvious distinction between the two models, though, is the addition of reinforcement.

Behavioralists do tend to minimize or ignore the mental operations when learning occurs. Or they simply assume that "something" does take place, but this something is impossible to measure directly. Perhaps also, they feel that this cognitive activity will be reflected, to some extent, in the response that is given.

Critics claim that behavioralists believe that the learning act is a linear system that can be analyzed in small units. "The central assumption of the systems analysis is that any entity which can be conceived of as a product must be the operations of the system, and that any system can be conceptualized in linear terms" (Zoellner, 1972). While this explanation may be true for many systems analyses, most behavioralists will not accept this statement in all learning situations. And certainly, by understanding the nonlinearity of the composing process, composition researchers take this dispute even farther by stating that the linear model of composing is nothing but a flow chart, that in fact the composing process, which is made up of many mental operations that do not necessarily take place sequentially, involves operations that indicate individual strategies which are recursive throughout the so-called three stages of the composing process (prewriting, writing, and rewriting).

A major premise of behavioral theorists is that any learning unit needs to be broken down into small units and grouped and sequenced from most basic information to most advanced. There, thus, exists a hierarchy of information. While the sequencing and/or breaking down of information may be analyzed somewhat linearly, the mental operations that take place when one goes through a linear unit are not necessarily linear. Most likely learning takes place at differing levels or stages of sophistication and difficulty. This explanation of learning supports the behavioral stand that the most basic information is hierarchically related to the most advanced. However, it does not restrict itself to linearity.

Bruner's belief in a spiral curriculum incorporates both the relatedness between most basic and most advanced material and the belief that learning is not linear. Bruner has "suggested that curricula be 'spiralized' to assure constant return in successively more elaborate forms to these core ideas" (Zoellner, 1972), ideas which are bits of information to be learned. Although Bruner intended his spiraling theory to deal with content (and thus leans toward a cognitive stand), another powerful factor in his spiraling theory is reinforcement, for it is only through reinforcement that the learner knows whether or not his understanding of the content is accurate. Studies show that

reinforcement of prior tasks affect performance of subsequent tasks (Annett, 1969; Kagan, 1966; Lee, 1976; and Wingfield, 1979), and that reinforcement not only affects motivation (Latta, 1978; and Ururoglu & Walberg, 1979) but also affects one's self-image (Harari & Covington, 1981; and Primavera, Simon, & Primavera, 1974).

This spiralized concept of learning supports such behavioral learning techniques as successive approximation and shaping. Though perhaps in other terms, cognitive theory also adheres to successive approximation, shaping, and breaking down information into small units. For example, Ausubel's cognitive model of learning presents information through an initial generalized statement (known as an advance organizer), followed by more specific information. Likewise, as more specific information is being added, a form of successive approximation is taking place. This approximation is not so much in the behavioral sense (leading from most basic to most advanced) but rather in the sense that information is constantly being added. Thus the total content will be eventually learned in stages. And, to some extent, this adding of information parallels shaping. Eventually the desired learning will take place but only through stages by adding more and more content.

In Relation to Emig's Study (1971)

Emig's study, THE COMPOSING PROCESSES OF TWELFTH GRADERS (1971), is highly regarded and often referred to. When teachers of writing subscribe to Emig's findings, they are, however, subscribing to both a behavioral and cognitive understanding of writing. Emig states that "there are internal aspects of the assignment that may bear upon the student's writing process, and product." These aspects include

> 1) the registers--the field of discourse, the written mode, and the tenor; 2) the linguistic formulation of the assignment; 3) the length; 4) the purpose; 5) the audience; 6) the deadline; 7) the amenities, such as punctuation and spelling; and 8) the treatment of the written outcome--that is, if the teacher plans to evaluate the product, how--by grade? comment? conference? peer response? or by some combination of these? (1971)

Emig continues with external aspects which may affect the student s reception of a writing assignment. These aspects are

> 1) the general nature of the task, particularly the registers specified; 2) the linguistic formulation of the assignment; 3) the student's comprehension of the task; 4) his ability to enact the task; and 5) his motivation to enact the task. (1971)

When researchers refer to Emig's qualitative study as an accurate explanation of all factors that are involved in composing, they must also recognize the external, or behavioral, influences which are vital in the learner's

ability to manipulate these factors.

After all, if writers had not received reinforcement (or verification) of the accuracy of what they had learned, the cognitive structures on field of discourse, the written mode, the linguistic formulation of the writing, the amenities, the comprehension of the task, and the ability to enact the task might very well be inaccurate. This inaccuracy might be the reason for the writers' failure at such a task. Likewise, verification that their command of such writing tasks is accurate might be the very reason for their success. Other factors, such as treatment of the written outcome and their motivation to enact the task, are highly external, highly behavioral. These external aspects, according to Emig, may refer to the writers' perception of them, which is cognitive, but these perceptions are formed by prior external (behavioral) incidents.

Few people will disagree with Emig on her interpretation of those factors which influence the writing task. Even cognitivists will agree that behavioral aspects are a part of learning. Now that writing is viewed as a process, teachers must take into account the mental operations and the mental development of writers and the external factors that have influenced their ability to attempt past writing tasks and those that are influencing the present writing task.

A DEFENSE OF BEHAVIORAL ORIENTATION

Skinnerian Model versus Pavlovian Model

As stated before, critics of implementing behavioral theory to learning tend to interpret a behavioral application in terms of the Pavlovian model. Behavioral theory, however, is not based solely on Pavlov's methodology. Instead, a more flexible, more individualistic behavioral model which parallels the humanistic side of learning is the Skinnerian model.

No writing task is totally free, that is, there is always some predetermined direction of a writing task. When applying the Pavlovian model or the Skinnerian model, a writing instructor is dictating a response in various ways. The response is affected by the initial stimulus (in the case of writing, the essay topic), the role (or power) of the stimulus (how general or how limiting the stimulus is in regard to the response it is to effect), and the degree of specification it will dictate. The degree of this predetermination is what distinguishes a Pavlovian application to a writing task from a Skinnerian application.

Three Disparities Between the Two Models

According to Zoellner (1972), there exist three major disparities between the two models: 1) freedom versus coercion (in the Pavlovian model the response is specified with coercive linearity whereas in the Skinnerian model the writer provides any bit-of-behavior which is susceptible to shaping toward the desired terminal behavior); 2) stimulus versus reinforcement (in the Pavlovian model the task is the highly specified stimulus which impinges on the student whereas in the Skinnerian model the stimulus-definition becomes a matter of secondary importance); and 3) tight specification versus loose specification (in the Pavlovian model there is a tightly particularized specification of a desired terminal behavior whereas in the Skinnerian model there is a much more generalized specification of the terminal behavior).

The three disparities--freedom versus coercion, stimulus versus reinforcement, and loose specification versus tight specification--are very much interrelated. The difference in responses is based on the type of stimulus given: the more general the stimulus is, the less forced the response will be because the stimulus will dictate less what the response is supposed to be. Likewise, the more general the stimulus is, the looser the specification will be.

The exactness of the response to the predetermined response also plays a vital role in specifying whether the task is Pavlovian or Skinnerian. In a writing situation, though, it is difficult to predetermine exactly what the response should be, though, it is not totally impossible. Many times, writing instructors, after giving an assignment, will create what is known as the "ideal text." That is, instructors will, in their minds, conceive what they feel should be in that essay; and as they evaluate the essays, they will compare the student essay with the "ideal text." Literary essays and persuasive essays tend to be more susceptible to this degree of predetermination than narrative or descriptive essays.

Not only do the mode (description or narration) and the purpose (persuasion or literary analysis) of an essay determine the closeness between the student essay and the "ideal text" but so does the topic itself. For example, when students are asked to write a character analysis on a character in a short story, there is only so much they can write. Instructors are in a position which allows them to create this "ideal text." Also, when the writing task is an argumentative essay, an "ideal text" can be easily created since there is a limit to the number of logical points with which a writer can use to make his stand. The linguistic formulation of the essay (of any type) also puts the writers

in a position of predetermination: they must adhere to the rules which govern how we present words or ideas linguistically.

Perhaps the writing task which best allows for total freedom is one which is general enough so that all students can respond to the task in their own way. An example would be, "Write an essay on an event that had a tremendous emotional impact on you." Since not all students have had the same experiences, this topic allows for final product variations. Also such a generalized topic gives the students many choices to decide from: which events had an emotional impact, and of these events which ones should they write about (not only in terms of which ones they have a good command of but also which ones they don't mind telling other people about)?

As stated before, the first major disparity between the Pavlovian model and the Skinnerian model is freedom versus coercion. When the Pavlovian model is applied to teaching composition, the student is forced into writing an essay with predetermined content, e.g. a character analysis. Essay topics that are general and personal in nature allow the freedom that parallels the stimulus to which the Skinnerian model refers. This type of essay topic allows the writers to determine on their own "the parameters of the learning sequence."

The second disparity, stimulus versus reinforcement, not only refers to the addition of reinforcement but also minimizes the stimulus itself (that is, the essay topic should not be all powerful but rather should be general enough to allow for individual variations in performing the writing task). Studies referred to before (Annett, 1969; Harari & Covington, 1981; Kagan, 1966; Latta, 1978; Lee, 1976; Primavera, Simon, & Primavera, 1974; Ururoglu & Walberg, 1979; and Wingfield, 1979) show that reinforcement is a vital factor in any learning situation. Certainly if students have had many failures (or low evaluations) in the past, their attitudes towards the task confronting them will be affected by these prior experiences. On the other hand, though, if they have not received reinforcement (or some verification) of their work, they will not know if their command of the various aspects of a writing task is strong. Students who have done well on prior writing tasks will most likely attempt the writing task confronting them with a more positive attitude than those who've received negative reinforcement. Forms of reinforcement include a formal evaluation of an essay, student-teacher conferences (prior to and after a formal evaluation), and peer group evaluations of essays (generally an informal assessment or reaction to an essay prior to turning the essay in for a formal evaluation).

The third disparity, tight specification versus loose specification, also overlaps with the essay topic. If the topic is general and personal enough, the specification of the terminal behavior (or the essay) will be looser than if the topic were highly specified (such as an argumentative essay).

All three disparities can be taken care of through the essay topic, or the initial stimulus. Because writing assignments cannot be limited to personal essays, the Pavlovian model cannot be totally ignored. But instructors must consider the danger of highly specified essay topics because this kind of topic can easily lead to an "ideal text," which may lead an unfair assessment of an essay. Reinforcement cannot be eliminated at any time. Because students many times equate grades (formal reinforcement) with receiving credit for an assignment, teachers must provide several types of satisfying feedback, conferences, peer response groups, written comments, and evaluation.

The Seven Principles of Skinner-Box Learning: An Application to Writing

One key to combining cognitive and behavioral orientations is to implement the Skinnerian model of behavioral psychology. The seven principles are 1)

concentrate on the individual organism; 2) begin with some bit-of-behavior that is part of the student's naive repertory; 3) allow for a freely emitted stimulus; 4) insure a high frequency of responses; 5) insure a low duration of responses; 6) reinforce desired responses immediately; and 7) shape the behavior through intermediate specifications of responses.

The first principle of this model is to concentrate on the individual organism. This individualistic concern breaks away from the massively linear characteristic of Pavlovian behavior which expects the subject to perform a certain response which has been predetermined and has been initiated by an experimenter-provided stimulus. Concentrating on the individual (i.e. mental operations and mental development differ from one person to the next) also parallels the individualistic concern of cognitive theorists.

Next, the instructor begins with some bit-of-behavior which is part of the student's naive repertory and is somewhat related to the desired learning.

> Under such procedures, any response of the organism remotely approximate to the desired final behavior is right; he shapes the behavioral continuum from that point. There are no wrong responses because the experimenter is always able to find some bit-of-behavior in the behavior continuum which will provide a viable base for the beginning of the learning sequence. (Zoellner, 1969)

Also, in the Skinnerian model, the experimenter does not demand that the subject respond or behave in a certain way.

> Rather, he simply waits for whatever response is available to the organism and which it may freely emit. Thus, it is the organism, not the experimenter, which freely supplies the initial datum or bit-of-behavior which is the beginning of the learning sequence. (Zoellner, 1969)

These two principles, in relation to English instruction, parallel composition topics which are many times teacher-assigned (although the students' approaches to doing that assignment are their own) and literature analysis (students may have their own insights providing they adequately and reasonably support them).

The fourth principle is that the teacher should insure high frequency of responses.

> The shaping process is based on the assumption that the organism will have innumerable opportunities to respond. The experimenter uses this multi-trial situation to shape the organism by successive approximations toward the desired terminal behavior. (Zoellner, 1969)

In an English unit, a teacher could apply this principle by breaking down into units the components of an essay (mastering sentences, mastering individual paragraphs, mastering complete essays) or by breaking down into units the components of a character analysis: what are the characters' thoughts, what are their actions, what do they say about other people, what do others say about them, what are their physical descriptions, and what words has the

author used to convey the types of people the characters are? The desired terminal behavior is a complete essay or a complete character analysis.

The teacher should insure a low duration of response and reinforce desired responses immediately. The responses should be brief when a teacher is shaping a student's learning to the desired terminal behavior. In the applications listed above, a low duration of response on developing paragraphs would keep the student's mind on the task at hand. According to Zoellner (1969), "The Skinner-Box apparatus generates a response which takes a short time to occur and leaves the subject in the same place ready to respond again."

Also, reinforcement does not always have to be oral. In the case of the completed essay, the student can benefit from extensive terminal comments; in other words, reinforcement does not necessarily have to follow the task immediately. The student can "profit by his instructor's marginal comments and make a reasoned assessment of a scribal performance done two weeks earlier" (Zoellner, 1969). What is important is that the behavior be reinforced prior to going on to the next stage of shaping "before some other segment of behavior intervenes" (Zoellner, 1969).

The final principle of the Skinnerian model is that the behavior should be shaped through intermediate specifications of responses.

> In operant learning final behavior is not achieved in one great leap, but rather involves a multi-trial process where each response represents a closer approximation of the terminal behavior. (Zoellner, 1969)

This principle highly reflects the cognitive belief that a writing task is done in stages; students attempting a final draft without some pre-writing and rough drafting strategies many times will find out they do not have readily at hand enough information to write or they have not given themselves enough opportunities to manipulate the information into a highly communicable piece of writing. In regard to the character analysis, students attempting to analyze completely a character in a story might have difficulty if they attempt the completed analysis without breaking it down into certain stages or aspects (such as the character's actions, thoughts, and conversations), and dealing with them individually.

VARIABLES OF THE COGNITIVE THEORY: AN APPLICATION TO WRITING

According to Wildman and Burton (1981), in a cognitive instructional theory there are two input variables (the student's existing cognitive structures and the content and/or discipline structure), three process variables (receiving or subsuming information into the cognitive structure, transformation of the memory structures, and tuning or perfecting operations with memory structures), and one output variable (students displaying appropriate and/or predicted cognitive structures).

Input Variables

The two input variables are the student's existing cognitive structures and the content and/or discipline structure. According to Hudgins (1977),

> cognitive structures are the formulation of knowledge that the learner carries in his head. . . . The learner acquires these accurate representations . . . of the nature of the physical, social, or natural world only through his own experiences and largely through his own efforts. Theoretically, the more extensive and intensive his interaction with materials, concepts, theories, and specific information that constitute a branch of knowledge, the closer will be his cognitive structure to the structure of that content.

In a writing situation cognitive structures refer not only to the content of a particular topic but also to the writer's ability to externalize the language of the content in some lexical, semantic, and grammatical form. Since topics of a writing task vary (in the subject itself, the

audience, the mode, and the purpose), cognitive structure becomes a term for what is referred to as episodic and semantic memory. According to Flower (1979), episodic memory is a record of a person's experiences, which are related in temporal-spatial relations to other experiences. The remembered episodes are autobiographical events, describable in terms of their perceptible dimensions or attributes. Semantic memory, on the other hand, is the memory necessary for the use of language. It is the organized knowledge a person possesses about

> other verbal symbols, their meanings and referents, about relations among them, and about rules, formulas, and algorithms for the manipulation of these symbols, concepts, and relations. (Flower, 1979)

Basically, in semantic memory facts and concepts stand as the link for other words and symbols, but without their temporal and autobiographical roots. While episodic memory provides information for most writing tasks, semantic memory helps the writer externalize the information in a lexically and grammatically correct manner.

An effective writer will be one who has the cognitive structures that contain not only information on the topic but also the skills to present this information in communicable form. The content and discipline structure will also affect certain strategies. For example, different processes are required for different modes. In a study by

Rubin and Piche (1979), of the three modes of discourse--argument, narration, and description--argument resulted in writing that was more syntactically complex than either description or narration. Likewise, audience can affect the syntactic complexity of a writing. Studies by Crowhurst and Piche (1979) and Neilsen and Piche (1981) ound that when a trusted adult is the established audience an essay will have syntactically more complex sentences than if the audience is formal evaluator or good friend.

Process Variables

When one writes, the conscious act by the writer to generate ideas about the topic is a retrieval process. According to Stallard (1976), after a writer is made aware of the need to originate a message presented in the form of an essay topic, the first stage of retrieval takes place. The process of discovery is related to his existing cognitive structures. Once writers have begun to verbalize this process, they begin to retrieve information from their long-term memory and form networks of these bits of information.

The initial search of the cognitive structure begins a series of searches which end when the writer has thoroughly exhausted the available information. These searches

parallel prewriting strategies, such as invention strategies (Burke's pentad/ratios, Pike's tagmemics, and classical invention) and brainstorming or listing. The purpose of these searches is to make information available for possible use.

The next process variable is transformation of memory structures. This variable parallels the second component of the linear writing model known as writing, sometimes referred to as a rough draft. It is during this step that the writer attempts to make meaning of statements that have been newly formed during the retrieval process. The writer goes through a process of categorizing related statements, presenting them in a logical form called a paragraph.

> It is at this point, and not before, that consideration must be given to organization, style, and method of paragraph development. He has that content in a concrete and manipulable form; that manipulation amounts to revision. (Stallard, 1976)

Once the writer has put on paper some ideas on the topic and has organized them in some way, the process of revision can take place. This process involves the revision of the message's content and form. According to Stallard, revision is cyclical.

> Each attempt at revision generates need for further revision until the potential for change and development is exhausted and the cognitive structure ceases to change. . . . The process ends when purpose and audience are entered into the composing process during revision. . . . They will influence the cognitive structure and mandate

revision and development as well as conformity to form and style. (1976)

The final process variable is tuning or perfecting operations with memory structures. Although the writing of an essay, at any stage of the linear model, is external, cognitive processes must take place in order for the externalized version to occur. "Tuning or perfecting," in a writing task, refers to the rewriting stage during which all that has been written is put to a more definitive test: not only are the content, its logic, and development reviewed and modified (if needed), but also more cosmetic aspects of the writing, such as punctuation, spelling, and diction, are looked at.

Output Variable

The output variable, students displaying appropriate and/or predicted cognitive structures, is simply the essay. The paper is a reflection of all the process variables which were effected by the input variables.

THE COGNITIVE CONNECTION: THE WRITER AND THE READER

Much research has been conducted on ways people learn. To some extent, an essay fits in with much of this research. After all, an essay, in many ways is a learning tool--not only for the writer but also the reader.

Many times essays are criticized for being too vague. Primarily the word vague means that the reader is having a difficult time trying to understand exactly what the writer is trying to communicate. The remedy is to expand ideas in the essay by including specific examples. Other times essays are criticized for containing too much jargon. An essay on nuclear fission containing many technical terms would have to be "translated" for a general audience. And, essays that are not written in some logical order and development would be criticized for this lack of organization or development. Essays that are vague, that contain too much technical language, and that are poorly organized or developed violate much that we have learned about how people learn. There are three basic areas from studies on learning which can be directly applied to writing: 1) cognitive structures; 2) predicting ability; and 3) organization.

Being vague and containing too much technical jargon closely relate to the findings on cognitive structures. A reader-learner must possess sufficient cognitive structures on a topic in order to understand what the writer-informer is trying to convey. Readers, while it is not necessary for them to know everything the writer is conveying, must have the frameworks related to the topic. The readers use the information common to them and the essay primarily as a

foundation. Since new information, or unfamiliar information, will be processed through its association with the information that the readers and the essay have in common, the key to successful processing is that the common information and the new, associated information must be presented clearly. One of the most effective ways is to incorporate familiar or easily processed examples, or specifics. The building of cognitive structures relies much on the relationship between the information the reader already possesses and the information in the essay. After all, one assumes that when one reads an essay, there will be a certain amount of new information.

"Readers need a framework for new ideas" parallels Ausubel's Subsumption theory: in order for learning to be meaningful there must be a "nonarbitrary and substantive relationship between knowledge in the cognitive structure and new knowledge to be learned. The cognitive structure is comprised of hierarchally organized facts, concepts, and propositions" (Lawton & Wanska, 1977). Although much of the theory relates to encoding (that is, information that is being processed for the first time), there is a tremendous interrelatedness between encoding and retrieval. This theory gives support to Reader-Based prose.

If the writer does not take into account not only what the readers know about the topic of the writing task but

also what they don't know, the writer's attempt to communicate may be greatly affected. In fact, the writing itself serves as a cueing device: once the readers begin, they are using the words of the essays as cues which, once they are temporarily stored in the short-term memory (STM), begin the retrieval of information stored in the long-term memory. If the contextual cues of the writing do not connect with the information the reader has stored in LTM, the reader will have a difficult time understanding what the writer is attempting to communicate. This statement is supported by the research on encoding alluded to by Klatzky (1975). That is, if the learners have previously encoded words related to the new information (or, many times information that is combined with new previously established information), they will be able to retrieve information related to the content of the essay.

The more information of the essay (or information that is to be encoded) readers are able to connect with the information in their LTM, the more effective the communication of the writing will be. Once the information from the LTM is processed with the information that is being encoded, meaning takes place. If the reader does not have the cognitive structures related to the information of the essay, meaning will not take place. There is the possibility, though, that information unfamiliar to the

reader will be processed if it is clearly stated (or perhaps clearly defined) and if it can be connected to the existing frameworks the reader has which is related to familiar information stored.

Reader-Based prose relies heavily on the cognitive frameworks the reader has on any given topic. The more closely related the reader's framework is to the essay topic, the greater the comprehension of the reader will be. Again though, a reader may gain significantly greater insight into a topic if the framework of the essay possesses information familiar to the reader in addition to new information that is meaningfully associated with the familiar information. According to Lawton & Wanska,

> to ensure that meaningful learning occurs, it is necessary to optimize a) the potential of cognitive structure to act as a subsuming of ideas, and b) the potential of knowledge in terms of its capability of being related in some 'sensible' fashion to cognitive structure. (1977)

One key to effective reading is the reader's ability to predict. The reader is able to make inferences from the essay because of the relatedness between the essay and the reader's prior readings. For example, if readers have read much on a topic and are reading another essay on the same topic, they will be able to make inferences through their ability to predict; that is, the essay itself will not have to be as explicitly informative as it actually is. The

problem, though, that arises is that if the essay is presented in such a way that does not fit in with their prior readings, their ability to predict will interfere with their processing the present essay. The writers need to keep in mind the "reality" of any topic (that is, an essay should be presented in a reasonably predictable way both in terms of format and content). If they present it in a way that is not reasonably realistic, the reader not only will not be able to make accurate inferences but predicting may actually interfere with the reading of the essay.

A long-standing rule for writing is that an essay should be well organized. Theoretically, this rule parallels what is known about how human memory automatically organizes information that has been processed. An example of this automatic organization is, which question takes less time to respond to: 1) give a p-word that is a fruiit or 2) give a fruit that begins with the letter p? Studies show that the second statement takes less time to respond to than the first statement. It illustrates that human memory does organize information generally through categorization. It takes less time to repond to the second statement because the category fruit is introduced before the category p-words. Since there are fewer fruits than p-words, the initial cue "fruit" facilitates recall and thus meaning (Moates and Schumacher, 1980). Also, common sense tells

us that human memory organizes information for us. Since we did not sit down at one time and learn all p-words or all kinds of fruit, yet we can quickly respond to such statements as those given above, some type of organizing mechanism must exist in our memory.

In a writing task, the more organized the essay is, the easier it will be for a reader to process the information of an essay. Likewise, the more the readers have in common with the content of the essay, the easier it will be for them to understand what the writer is trying to convey.

Along with a framework, the reader's expectations and the reader's capacity to organize ideas into natural hierarchies become very important factors in the success of a writer's attempt to communicate. Like the framework, these expectations and the capacity to organize enter into the encoding and retrieving processes. They are simply strategies which can either facilitate or hinder one's attempt to communicate. These strategies aid in getting information from LTM to STM where meaning takes place. Since reading is a relatively rapid phenomenon, the degree to which these strategies are facilitated will influence the effect of the writing itself.

When one writes, these three components must be taken into account. The readers must have at hand an essay that

provides a framework or is organized in such a way that facilitates the processing of the information. Also, the writer must capitalize on the readers' capacity to relate incoming information with their ability to predict what follows in an essay. And, the writer must use words or ideas that the reader also possesses or must present new ideas so that new ideas can be subsumed in cognitive structures that the reader already possesses.

THE SEVEN COMPONENTS OF AN INSTRUCTIONAL DESIGN

Wildman and Burton, in their article "Integrating Learning Theory with Instructional Design" (1981), break the instructional design into the following components: 1) conducting needs assessment and identifying/prioritizing instructional goals; 2) performing learning outcome analyses; 3) describing student entry behaviors; 4) grouping and sequencing learning objectives; 5) designing delivery systems; and 6) designing or selecting learning activites. Since the model is atheoretical (although it appears to accommodate greatly cognitive theory), an additional component needs to be added: 7) reinforcement.

Needs Assessment

According to Burton and Wildman,

> the major goal of performing needs assessment on a routine basis is to ensure that more instructional time is available especially for those few 'needs' that have been empirically validated and have survived a rigorous process whereby priorities among needs are identified. . . . Typically, the procedure involves measuring empirically (for some target group) the discrepancy between existing conditions (e.g., skills attitudes, achievement patterns) and some predetermined required conditions. These differences or discrepancies are subsequently restated in verbal form (i.e., as goals) and placed in some order of priority. (1981)

The two most often used means for determining needs assessment are pretesting and knowledge of what has gone on before. Both orientations recognize pretesting and knowledge of what has gone on before as effective means to assess needs.

Pretesting is perhaps a more effective means for most long-term instructional designs: usually year-long courses involving alternating units, especially in language arts courses during which grammar and usage, composition, and different literary genres are taught. If a course is sequential--that is, each unit is a building block for the next unit--knowing what has gone on before is the more effective means since the post-test of the prior unit may serve as a pre-test for the next.

When instructors attempt to determine needs assessment cognitively, they are attempting to determine the cognitive structures that students have on a particular bit of knowledge. The purpose of pretesting for cognitive structures is not just to determine prior knowledge but also to determine the student's capacity to deal with the information cognitively. The knowledge itself is not the only concern, but also the student's cognitive capacities to manipulate that knowledge. According to Wildman and Burton (1981), "Process information would be highly valued under cognitive orientations and these data are also not generally available through current needs assessment methodology." Lawton and Wanska also support this weakness in the cognitive orientation:

> Pre-tests, which measure prior knowledge of concepts to be learned (or in a post-test performance), give no indication of the probability that a learner will use some existing subsumer as an alternative to those presented in an advance organizer. (1977)

A behaviorally oriented instructional design at the needs assessment stage is basically concerned with just prior knowledge. It is this more reasonable focus that makes a behavioral orientation at this stage stronger. After all, the methods that exist for determining needs cognitively must be written in behavioral terms: the student must respond overtly in order for the cognitively oriented instructional designer to make decisions about the student's

prior knowledge.

Learning Outcome Analyses

Regardless of the types of objectives used, almost all learning outcomes--or goals--must be measured in behavioral terms.

> The desired ends of education involve internal, more generalizable modes of thinking, feeling, and acting. . . . The behavioral manifestations for the internal, long-range objectives are external indicators that something positive is occurring internally. (Airasion, 1971)

Airasion contends that no one, no matter how hard and how long he observes, will ever see a student "understanding," "appreciating," "thinking critically," and "feeling."

> These are activities which occur within the individual and which are unobservable. We are able to see only overt actions which we accept as evidence of understanding, appreciation, and feeling. (Airasion, 1971)

Wildman and Burton (1981) feel that the learning outcomes must be a direct result of the objectives and activities: many times after students have performed certain objectives they have not achieved the desired goals. It is their contention that upon completing certain objectives the student should have attained the desired goals. The underlying point of their contention is that there must be a certain relatedness between an objective and a goal. If the objectives do not lead to the goals, then there is a serious element of incompatibility which must be remedied.

Airasion points out the futility of establishing goals that are difficult to measure. Sometimes people's appreciation for Shakespeare's HAMLET occurs years after they have studied it. While one can state cognitive objectives, like affective objectives, in non-behavioral terms, the goals themselves must be stated in behavioral terms. Otherwise, it is virtually impossible to measure the attainment of a particular goal. According to Airasion, "to reject behavioral definition of indicators of these activities puts one in a position of being unable to demonstrate that any learning has taken place" (1971).

Almost any cognitive objective can be illustrated by a behavioral term. Again, this connection between cognitive and behavioral orientations implies that the orientations are interrelated and can co-exist. In fact, without behavioral terminology, cognitive objectives would be difficult to measure. Thus, as Airasion states, it puts "one in the position of being unable to demonstrate that any learning has taken place."

Many people do defend the use of behavioral objectives even though the behavioral objectives do not take into account the humanistic side of learning. Dieter claims that

> behavioral objectives force the teacher to state what exactly humanistic behavior is. The goals of English are often vaguely stated and poorly evaluated. . . . Behavioral objectives can aid the teacher in clarifying and making concrete these

somewhat vague objectives. (1970)

Dieter supports Wildman and Burton's point of the relatedness among the components of an instructional design:

> When forced to express the outcomes of a literary work in terms of observable student behavior, a teacher more readily questions the appropriateness of the material, teaching method, and testing device. (1970)

Student Entry Behaviors

> According to Wildman and Burton, student entry characteristics are important when one makes decisions about an instructional design. To begin, we know that where active processing is required, we need to look for a certain motivational state, a kind of tension. . . . It also seems advisable, from a cognitive view, to eventually conduct analyses that measure finer motivational determinants of student performance. (1981)

Motivation comes in many forms. Some students are motivated to achieve for the sake of achievement; others achieve to fulfill their potential abilities (Wingfield, 1979). While these forms of motivation tend to be intrinsic, a powerful motivational determinant is reinforcement. Certainly if students have had bad experiences in the past, these experiences will affect their attitude/motivation towards subsequent experiences. Wildman and Burton state that

> routine learning episodes involve the ability or inclination to take risks, to work under conditions involving conceptual confusion, to propose and/or generate meaningful relationships and structures, and to evaluate one's own behavior. (1981)

Grouping and Sequencing Objectives

Both behavioral and cognitive orientations adhere to breaking objectives--and units of instruction--into small units. In a behavioral orientation, though, the units are grouped and sequenced according to what is the most basic information and what is the most advanced. The terms, most basic and most advanced, deal primarily with the level of complexity of the content. In a cognitive orientation, though, the level of complexity is not always the only concern. Instead, cognitive orientations deal with format or the presentation of the content. Generally, those cognitive orientations which utilize Ausubel's advance organizers present information first as a generalized statement--a definition, an analogy, or a concept--and furnish subordinate information about that generalized statement. Since both orientations would deal with complexity and format as a combined effort, the compatibility between the two still exists.

As stated before, a cognitive orientation adheres to the principle that information should be broken down into units. In his article "Composing: A Cognitive Process," Charles Stallard quotes Leonard Bloomfield:

> There is something always artificial about reducing a problem to simple mechanical terms, but the whole history of science shows that simple mechanical terms are the only terms in which our human capacity can solve a problem. The lesser

> variables have to wait until the main outline has been ascertained, and this is true even when these lesser variables are the very things that make our problem worth solving. (1976)

Bloomfield acknowledges both breaking down instruction into units and approaching the teaching of these units through first introducing generalized statements (much like Ausubel's advance organizer). Odell recognizes in his article "Piaget, Problem-Solving, and Freshman Composition," that overt behavior does not adequately reflect what people have learned (1973):

> We can make plausible inferences about what happens when we attempt to maintain intellectual and emotional equilibrium. Piaget does not suggest that equilibrium comes inevitably from the mechanical performance of conscious activities. He claims that only important parts of the thought process entail behavior which can be described with some precision.

Piaget does acknowledge the value of a behavioral orientation, although behavior does not completely reflect what mental operations have taken place.

Kenneth Pike once stated that

> one must segment the continuum of experience into units, discrete bits of experience. Without segmentation of events into recallable namable chunks, without abstraction of things as figures against ground, without reification of concepts as manipulatable as discrete elements by our mental equipment, man would be inept. (Stallard, 1976)

Cognitive orientation utilizes advance organizers to initiate learning. There are two types of advance organziers: expository and comparative.

> Expository organizers are used when the new learning material is completely unfamiliar . . . and attempt merely to provide inclusive subsumers that are both related to existing ideas in cognitive structure and to the more detailed material in the learning passage. (Ausubel, 1978)

Comparative organizers, on the other hand,

> are used when the new learning material is relatively familiar or relatable to previously learned ideas. In this case the aim of the organizer is not only to provide ideational scaffolding for the specifics in the learning passage but also to increase discriminability between the new ideas and the previously learned ideas by pointing out explicitly the principal similarities and differences between them. (Ausubel, 1978)

Despite the compatibility between cognitive and behavioral orientations in regard to grouping and sequencing objectives, one major difference is the absence of reinforcement in the cognitive orientation. Certainly if the student is not receptive (which may be based many times on the effects of reinforcement) it does not matter how objectives are grouped or sequenced.

Reinforcement

As stated before, when the Skinnerian model is applied to an instructional design, not only is reinforcement introduced but also an approach close to a cognitive explanation of the learning process is introduced. The Skinnerian model appears to be the missing link when one subscribes only to a Pavlovian model or a cognitive model.

It acknowledges the complexities involved in mental operations when one learns and the importance of reinforcement. Without reinforcement, total implementation of Bloom's taxonomy would be impossible: how can a student know, comprehend, apply, analyze, synthesize, or evaluate if he does not know if he has manipulated the information correctly. Likewise, Bruner's concept of a spiralized curriculum cannot occur without this important determinant.

The effect of reinforcement requires some attention to evaluation itself. Studies show that consequences can become very powerful in determining one's success at a given task (Lee, 1976). Negative evaluation can result in a conditioned effect such that the student will avoid the pain (in a learning situation, failure) by not doing the task (Wingfield, 1979). If a student has experienced many failures, he may refuse to risk success by not attempting the task at all (Kagan, 1966). Many times the tendency to avoid tasks which are potentially painful constitutes an attitude that is many times more important than the availability of rewards or reinforcers (Annett, 1969). The effects of reinforcers can determine one's motivation, which, at a low level, can become a deterrent to learning (Ururoglu & Walberg, 1979). Also, the motivational effects of success and failure feedback can transfer from one task

to another (Latta, 1978).

Reinforcement can also affect a student's self-image. Students attempt to maintain an image of high ability and competence; a conditioned reaction to reinforcement can threaten their self-images (Harari & Covington, 1981). Other studies show that academic success is related to a favorable self-concept (Primavera, Simon, & Primavera, 1974).

Not only do instructional designers need to be aware of reinforcers but also the type of reinforcers that will be conducive to learning itself. Again, regardless of any orientation, reinforcement can play a major role in whether that orientation succeeds or fails.

A COMBINED BEHAVIORAL-COGNITIVE ORIENTATION TO A COMPOSITION UNIT

Introduction

Three major factors will be considered in this section: a behavioral orientation to writing; a cognitive orientation to writing; and combining the two throughout the components of an instructional design. The topic, "Write an essay on an event that had a tremendous emotional impact on you," will be analyzed as it is applied to each of the seven components. The analyses will indicate which facet of the

writing task is behavioral or cognitive.

Needs Assessment

As stated before needs assessment relates to the discrepancies between existing conditions and some predetermined conditions in addition to taking into account those few needs which come up unexpectedly. In general (during any writing task) the differing writing levels of the students become a factor, and they may need additional instruction in grammar, usage, sentence structure and variety, and paragraph development.

Major, more preliminary concerns may be generating content and approaching the writing task in stages. Many invention strategies exist so that students may approach generating content in a more productive way. Likewise, writing an essay in stages will allow the student to be concerned with only a few factors of writing at one time. Approaching a writing task in stages is very cognitive because human memory can attend to only a limited number of things at one time. Linda Flower states:

> Writing places an enormous burden on short-term memory or working memory. The short-term memory is the active central processor of the mind--it is the sum of all the information we can hold in conscious attention at one time. Its limited capacity means that when we are faced with a complete problem--such as writing a college paper--the student can hold and compare only a few alternative relationships in mind at once. Trying

any of the so-called three stages of writing (prewriting, writing, or rewriting), invention strategies can be implemented especially for those paragraphs which are not as well developed as some of the others.

Hypothetically, students may be expected to increase their writing levels during this writing task. If their writing levels are plagued with insufficient content and a poor development of this content, then needs assessment would include strategies through which their writing levels would improve to remedy these problems.

Behaviorally, needs assessment of this particular writing task would be an analysis of the students' prior writing. Needs assessment would also involve reviewing their writing throughout the task to see whether these approaches are effective or not. Again, reviewing their writing throughout the task would be an external act, and thus behavioral. And, at the end of the task, the success (or lack of success) would be based on an external (or behavioral) observation of his work.

Cognitively, how effective these approaches are would be based on the written product (either an initial stage of writing or the final paper). While the analysis of the written product would be behavioral, a cognitive understanding of this task would take into account the

mental activities that must have taken place in order for the mental aspects of writing to be externalized. One way to determine the different cognitive activities that take place is to compare another writing similar to this task (for which they did not implement invention strategies and/or approach writing in stages) with this present task (for which they did implement one or both). If more content has been generated and there is better development of this content, one may infer that more (or different) cognitive activities took place during this writing task.

Learning Outcome Analyses

The major purpose for analyzing learning outcomes (or goals) early in any instructional design is to know, before much time and effort have been invested in any unit, the aim of the instruction or learning activity. Once such outcomes are established, the instructor is better able to determine what needs to be done in order to achieve these specific goals. In the case of this writing task, if the instructors want not only a contextual treatment as a major focus of this task but also sentence variety, paragraph structure, 500 words on the topic, or anything even remotely related to writing, they will be more aware of what needs to be done so that the student will be able to perform that final task (or outcome). Many times the outcome is an extension of the

initial stimulus such as in the case of this task: the success of writing about this emotional event will be based on the final product, and the final product is a more sophisticated version of the initial stimulus.

Student Entry Behaviors

In any writing task, and especially one such as this task, past experiences become major factors. Writing about an emotional event heavily relies on a writer's past. Obviously, a writer who has had few or no emotional events in the past will have a difficult time writing on this particular topic. Most likely though, the writer will have a sufficient quantity of emotional events. Past experiences relate more to writing experiences in general. If students have had many negative writing experiences, their motivation for this task will be affected. Likewise, if they've had many positive experiences, their motivation will be heightened.

The task should also be challenging. Many times students are given the "What did you do during the summer?" topic and, perhaps more often than not, do not put a great deal of energy into the writing task. When a topic does touch an emotional event, it will allow the students to recreate for themselves something that had an impact.

In a more grammatical way, though, a student may approach this writing task, possessing many writing problems (many of which may be discovered at the needs assessment stage). Writing level (or student entry behaviors) can be determined in several ways, perhaps the best of which is an initial essay (or a placement essay of some type).

More universal, though, are empirical studies which have given insight into activities learners can perform at certain ages. For example, the studies on syntactic complexity by Kellogg Hunt indicate the number of words per T-unit of certain grade levels. Hunt's study showed that grade 4 students write 5.4 words/T-unit; grade 6, 6.8; grade 8, 9.8; grade 10, 10.4; grade 12, 11.3; the average adult, 11.9; and the skilled adult, 14.8. While the value of the T-unit studies has the most impact on evaluation itself (that is, T-units are analyzed in terms of a final written product), there is an initial concern for T-units. If the instructor knows of Hunt's result, a realistic expectation of syntactic complexity can be determined early in the writing assignment. If this writing task (the emotional event) is given to tenth graders, the instructor can expect a certain level of syntactic complexity. On the other hand, if the instructor is unaware of Hunt's results and either expects a certain syntactic complexity that is too high or too low, the evaluation of the writing task may be unfair.

Another major insight into writing ability can be traced to Piaget's studies on egocentrism which showed that around age thirteen people are able to decenter their perspective by viewing things from someone else's perspective (Kroll, 1978). One of the major focuses in composition studies is Reader-Based prose which requires the writer to consider constantly who the audience is. Certainly if any writing assignment which requires the writer to consider audience is given to a student around or before the age of thirteen, the task may be developmentally misplaced. In the case of this topic on an emotional event (for which the writers would have to be constantly aware of audience since the informarion would be of a nature very personal to the writers themselves and not necessarily obvious to any reader), Piaget's findings would be especially crucial. A task which requires the writers to express their feelings in a way that takes into account an audience could most effectively occur when given to writers above the age of thirteen.

Student entry behaviors not only involve ability but also motivational factors, the degree of challenge of the topic (which would be related to how challenged the student felt about the topic), and developmental differences of age groups. While some entry behaviors may be very individual (differing ability levels), many are general (or universal)

in nature (one's ability to decenter and the number of words per T-unit).

Grouping and Sequencing Learning Objectives

While it is somewhat difficult to apply this component to an individual writing task, one can attempt to apply a behavioral concept and a cognitive concept to approaching a writing task. Objectives, which are steps in attaining the outcome, can be paralleled with approaching the writing task in stages (with the outcome--or goal--being the paper itself). A behavioral grouping or sequencing of objectives is bottom-up; that is, objectives will be sequenced and grouped according to those which are most basic leading to those that are most advanced. On the other hand, a cognitive grouping or sequencing is based on generalized information versus specific information; this orientation is considered top-down.

In a writing situation, a cognitive orientation is easier to apply because the writing task is initiated by a generalized statement: the essay topic itself. The writers then progress towards attaching to this topic specific information as they go through the so-called three stages of writing. A behavioral orientation, on the other hand, may limit itself simply to format: a more basic activity in

writing may be generating content regardless towards spelling, punctuation, usage, and idea development and logic. As the writer progresses through the writing task (from receiving the topic to achieving a final product), the activities and skills required become more complex (or perhaps more advanced).

While a cognitive concept of grouping and sequencing objectives (or in the case of this writing task, the mental operations that are initiated at all stages of completing the writing task) lends itself more to content and externalizing and re-working that content, a behavioral concept becomes more attached to format which because of its demanding more cognitive activities becomes related to the term more advanced (or complex).

Designing Delivery Systems

Many delivery systems exist for writing tasks. The teacher- or student-sponsored essay topic becomes the first system. If the instructor simply assigns a topic, the systems basically end at that point. In the case of the emotional event, a possible delivery system would be a short film or a short story or a poem which emits a high degree of emotions. While the topic and any form of media would be external (and thus behavioral), they would also serve as a

generalized introduction to the writing task. This generalized introduction would be similar to Ausubel's advance organizer (which is cognitive).

It is perhaps at this level that the compatibility (and perhaps the strong interdependence of both orientations) is most evident. Although the systems themselves are external (behavioral), they initiate many cognitive operations.

Designing or Selecting Learning Activities

The systems mentioned earlier are also part of the activities to some extent. That is, the topic and any form of media are major concerns when one attempts to decide on what activities should follow the systems. The systems can also occur at any time of a writing task and, thus, can become interweaved with activities themselves (in fact at times the systems and the activities can be considered synonymous).

For this particular writing task (the emotional event), activities would include providing the students with many opportunities to work on their writing. One approach is to divide the task into three parts: time to generate content (sometimes called prewriting); time to organize, eliminate, and elaborate this content (sometimes called writing--or rough draft); and time to finalize this content in a more

polished form (sometimes called rewriting). An additional part may be revision of the final product. The amount of time for each of these parts should be determined by the task and writer.

Even though this task has been divided into parts which tend to connote some form of sequence, one must keep in mind that since writing is tremendously cognitive a sequential understanding of any writing task is a misconception. In fact, generating content can even occur in the revising stage and when writers generate content they are also revising their thoughts (they are making conscious choices of the content that eventually becomes part of their papers, and thus are revising by making these choices).

Dividing the task into parts, though, does provide a framework by which to break down a writing task so that the writer has to attend to only a few writing factors at a time. The framework itself is behavioral whereas the mental operations that take place while one works within this framework is cognitive.

Invention strategies are effective activities by which to generate content. Strategies such as Burke's pentad, Pike's tagmemics, and classical invention are cognitive in nature; that is, they tend to be very individual and very innate. Brainstorming, on the other hand, can be a group

activity and be both behavioral (student responding as a group) and cognitive (the mental operations that are required in order to come up with an external response). Another approach is to put the students in small groups and have them talk about events that have had emotional impacts on them. Talking about the event they may eventually write on will reacquaint them with the content (there is the possibility they will not talk about certain events, one of which may end up being the topic event, but this activity will get them to think about emotional events in general). Again, small group discussion would be both behavioral and cognitive. It is at this point that activities and reinforcement become interweaved; therefore, both will be dealt with at the same time in the following section on reinforcement.

Reinforcement

While the writing stage of the task would be highly individual (and thus cognitive), any externalizing of this information would be behavioral. At this stage (once rough drafts had been written) students could be put in small groups again and react to each other's paper. The interaction would be both behavioral (they would receive reinforcement of--or reactions to--their essays) and

cognitive (reinforcement of/reactions to their essays would verify the content and grammatical aspects of their papers and thus build cognitive structures).

The evaluation of the final product is very behavioral (it is reinforcement). There are various forms of evaluation. An instructor can evaluate it formally in written form and hand back the essay to the writer. On the other hand, the instructor can implement instructor-student conferences, one of which is the instructor and student going over an already evaluated essay. This conference would allow the student and instructor to discuss the essay solely in terms of the formal evaluation. Another form of conference is a graded conference during which an essay is graded. The value of this type of conference is two-fold: for the writer it demythologizes the grading process and it allows on-the-spot reaction to and instruction on the essay's strengths and needs for improvements. A third form of conference is one during which the instructor meets with two or three students and as a group they react to a final written product. This type can be either a grading conference or something very similar to the small group work done with rough drafts (an informal evaluation).

When people analyze a writing task in terms of the seven components of an instructional design, they can understand the interdependence of behavioral and cognitive

orientations. This interdependence (which allows for a combined orientation to a writing task or a much longer writing unit) becomes especially apparent in the delivery systems, learning activities, and reinforcement stages of the instructional design. Needs assessment and student entry behaviors tend to be more cognitive than behavioral whereas learning outcomes and objectives tend to be very behavioral (since they heavily rely on some external indication of mental operations).

A NOTE ON THE AFFECTIVE DOMAIN

Besides the cognitive and behavioral domains, a third essential domain that should be considered in designing any learning units is the affective domain. "The affective area deals with a student's self-concept, personal growth and emotional development" (Eggen, et al., 1979). The affective domain deals more with the personal aspect of an individual whereas the cognitive domain deals with the mental operations of learning and the behavioral domain deals with external influences. The three domains are interrelated in that they can greatly affect each other.

Reinforcement can affect one's self-concept, in that negative experiences on certain tasks will affect one's motivation towards subsequent tasks. Negative experiences

themselves may be based on one's cognitive making. That is, if a writer has received numerous low grades on writing assignments (behavioral), it may be because the writer possesses insufficient knowledge or strategies for manipulating that particular writing task (cognitive).

On the other hand, personal growth and emotional development are very individual and somewhat unrelated to learning itself (or is simply not limited to learning). Education (and writing, in particular) can play a role in developing one's personal growth and emotional development. Certain writing assignments, such as the one which has the writers write on an event that had an emotional impact on them, can put them in a situation in which they come to a better understanding of certain emotions.

Affective goals include such activities as critically reading or appreciating something. The key to achieving affective goals is through the selection of delivery systems and designing learning activities. The more a designer is in tune with materials which allow themselves to be critically read and/or appreciated, the easier it will be for the learner to achieve these goals. The major point, though, is that another key factor in attaining these goals is the learners themselves--in terms of motivation (behavioral) and mental ability (cognitive). If they are motivated and have the ability, the learning event itself

should be optimally successful if the content lends itself to being appreciated and critically read--or any number of affective goals.

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Despite her stature as a human memory expert, Roberta Klatzky brings much of what is known about human memory to a very understandbale vocabluary. The text is all-purposeful in that it gives all viewpoints (many of which conflict with one another) on memory issues.

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Kroll applies Piaget's stages of intellectual growth to writing. He addresses the composition issue of Reader-Based Prose by stating that until writers reach the age at which they can decenter their perspectives (that is, take on someone else's viewpoint), Reader-Based Prose is almost impossible.

Latta, R. M. "Interactive Effects of Initial Achievement Orientation and Prior Success Feedback on the Mastery of Subsequent Difficult and Easy Tasks." American Education Research Journal, 15(1), 1978, 17-24.

Lawton, J. T. & S. K. Wanska. "Advance Organizers as a Teaching Strategy: A Reply to Barnes and Clawson." Review of Educational Research, 47(1), Winter 1977, 233-244.

Lee, S. "Motivational Effects of Normative Feedback Following Success-Failure Experience on Attribute Identification Performance." American Education Research Journal, 13(4), 1976, 255-266.

Moates, D. R. & G. M. Schumacher. An Introduction to Cognitive Psychology. Belmont, CA: Wadsworth Publishing Co., 1980.

This book is generally used in undergraduate educational psychology courses. The field of cognitive psychology is updated. For example, an article by Gagne and White (1978) classified the four kinds of memory stores. Moates and Schumacher approach these stores with more complexity and distinguish more finely the different types of stores.

Neilsen L. & G. L. Piche. "The Influence of Headed Nominal Complexity and Lexical Choice on Teacher's Evaluation of Writing." Research in the Teaching of English, 15(1), February 1981, 65-73.

Odell, L. "Piaget, Problem-Solving, and Freshman Composition." College Composition and Communication, 24(1), February 1973.

Primavera, L. A., W. E. Simon, & A. Primavera. "The Relationship Between Self-esteem and Academic Achievement: An Invesitgation of Sex Differences." Psychology in the Schools, 11, 1974, 213-216.

Rubin, D. L. & G. L. Piche. "Development in Syntactic and Strategic Aspects of Audience Adaptation Skills in Written Persuasive Communication." Research in the Teaching of English, 13(4), December 1979, 293-316.

Stallard, C. "Composing: A Cognitive Process Theory." College Composition and Communication, 27(2), May 1976, 181-184.

Stallard explains the cognitive processes involved when one writes. Once the writer receives the stimulus to write, he then begins a series of searches of his long-term memory. These searches involve not only generating content but also revision.

Ururoglu, M. E. & H. Walberg. "Motivation and Achievement: A Qualitative Synthesis." American Education Research Journal, 16(4), 1979, 375-389.

Wildman, T. M. & J. K. Burton. "Integrating Learning Theory with Instructional Design." Journal of Instructional Development, 4(3), 1981, 5-14.

Wildman and Burton explain the components of an instructional design and the variables of the cognitive instructional theory. Although the article leans heavily towards a cognitive understanding of learning, the instructional design itself is atheoretical, allowing any teacher or unit designer to apply the framework to his own content area.

Wingfield, A. Human Learning and Memory: An Introduction. New York: Harper and Row, Publishers, 1979.

Zoellner, R. "Talk-Write: A Behavioral Pedagogy for Composition." College English, 30, January 1969, 267-320.

Zoellner applies the seven principles of the Skinner-Box learning to writing. The shortcoming is that because of its date of publication (1969), it does not address writing as a process. But it is written in such a way that compositionalists can update the application of these principles to what is now known about the composing process.

--------. "Behavioral Objectives for English." College English, 33(4), January 1972, 418-432.